

We claim:

1           1.     A system with enhanced water flux through a filter membrane, the system  
2     comprising  
3           an electromagnetic radiator which produces high-power, pulsed blackbody, deep-ultraviolet  
4     radiation, the UV reactor having at least one fluid inlet and at least one fluid outlet and having at  
5     least one treatment chamber;  
6           a filtration membrane, the filter membrane disposed adjacent the at least one fluid outlet of  
7     the electromagnetic radiator to filter the water irradiated with the pulsed blackbody, deep-UV  
8     irradiation, wherein the precipitation of inorganic molecules and organically complexed minerals,  
9     partial or complete mineralization of organic molecules and the deactivation or destruction of  
10    microbes caused by the oxidizing species reduce the transmembrane pressure.

1           2.     The system of Claim 1 wherein the filtration membrane constitutes a microfiltration  
2     membrane.

1           3.     The system of Claim 1 wherein the filtration membrane constitutes of a plurality of  
2     membranes.

1           4.     The system of Claim 1 wherein the oxidation of water matrix by the pulsed  
2     blackbody UV yields ozone, hydrogen peroxide, and hydroxyl radicals.

1           5..    The system of Claim 1 further comprising pump and associated valves for  
2     backwashing the filtration membrane.

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1           6.       The system of Claim 1 further comprising a pre-filter disposed between the  
2       electromagnetic radiator and the inlet to the filter membrane.

1           7.       The system of Claim 1 in which the electromagnetic radiator comprises a lamp  
2       which develops a radiant excittance of between about 40,000 W/cm<sup>2</sup> to about 170,000 W/cm<sup>2</sup>.

1           8.       The system of Claim 1 in which the electromagnetic radiator comprises a lamp  
2       which develops a peak power output of between about 2 MW to about 6 MW.

1           9.       The system of Claim 1 in which the electromagnetic radiator comprises a lamp  
2       which radiates electromagnetic energy at wavelengths between about 185 nm to about 3,000 nm.

1           10.      The system of Claim 9 in which about 38 percent to about 52 percent of the output  
2       electromagnetic energy has wavelengths in the range of between about 185 nm to about 400 nm.

1           11.      The system of Claim 1 in which the electromagnetic radiator is pulsed at a rate of  
2       between about 0.1 to about 30.0 pulses per second.

1           12.      A method for enhancement of flux through a hollow fiber-type filter membrane, the  
2       method comprising the following steps:

3           treating the water to be filtered by exposure to pulsed blackbody, deep-UV electromagnetic  
4       radiation prior to purifying the water with the hollow fiber-type main filter membrane to prevent  
5       fouling of the membrane by the group of contaminants of water consisting of organic molecules,  
6       metal ions and complexed minerals.

1           13.     The method of Claim 12 further comprising the step of backwashing the main  
2     filtration membrane.

1           14.     The method of Claim 13 in which the step of treating the water with radiation lasts  
2     for 30 minutes.

1           15.     The method of Claim 12 further comprising the step of pre-filtering the water prior  
2     to filtration of the water through the main filter membrane.

1           16.     The method of Claim 12 in which the electromagnetic radiation develops a radiant  
2     excitance of between about 40,000 W/cm<sup>2</sup> to about 170,000 W/cm<sup>2</sup>.

1           17.     The method of Claim 12 in which the electromagnetic radiation develops a peak  
2     power output of between about 2 MW to about 6 MW.

1           18.     The method of Claim 12 in which the electromagnetic radiation has wavelengths  
2     between about 185 nm to about 3,000 nm.

1           19.     The method of Claim 13 in which about 38 percent to about 52 percent of the  
2     electromagnetic energy has wavelengths in the range of between about 185 nm to about 400 nm.

1           20.     The method of Claim 12 in which the electromagnetic radiation is pulsed at a rate of  
2     between about 0.1 to about 30.0 pulses per second.